This Page is Inserted by IFW Indexing and Scanning Operations and is not part of the Official Record

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

- ☐ BLACK BORDERS
- ☐ IMAGE CUT OFF AT TOP, BOTTOM OR SIDES
- ☐ FADED TEXT OR DRAWING
- ☑ BLURRED OR ILLEGIBLE TEXT OR DRAWING
- ☐ SKEWED/SLANTED IMAGES
- ☐ COLOR OR BLACK AND WHITE PHOTOGRAPHS
- ☐ GRAY SCALE DOCUMENTS
- ☐ LINES OR MARKS ON ORIGINAL DOCUMENT
- ☐ REFERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY
- ☐ OTHER: _____

IMAGES ARE BEST AVAILABLE COPY.
As rescanning these documents will not correct the image problems checked, please do not report these problems to the IFW Image Problem Mailbox.

CLMPTO

09/874,008

06/06/2001

swh

1. Multi-carrier communication system wherein data are transferred bi-directionally in a time division duplexed way, and wherein a first pilot carrier whose instantaneous frequency is a fraction of a sample rate of a first transceiver (VDSL_LT) and which is orthogonal to other carriers used in said multi-carrier communication system, is transferred to enable a second transceiver (VDSL_NT) to recover said sample rate.

CHARACTERISED IN THAT a second pilot carrier whose (second) frequency is a fraction of a time division duplexing frame rate and which is orthogonal to other carriers used in said multi-carrier communication system, is transferred from said first transceiver (VDSL_LT) to said second transceiver (VDSL_NT) to enable said second transceiver (VDSL_NT) to recover said time division duplexing frame rate, said second pilot carrier being different from said first pilot carrier.

2. Multi-carrier communication system according to claim 1, CHARACTERISED IN THAT said first pilot carrier is constituted by interpolating a plurality of carriers.

3. (Amended) Multi-carrier communication system according to claim 1 or claim 2, CHARACTERISED IN THAT said first pilot carrier and/or said second pilot carrier are/is randomised.

4. (Amended) Multi-carrier communication system according to claim 1 or claim 2, CHARACTERISED IN THAT said first pilot carrier and/or said second pilot carrier are/is modulated with data.

5. Multi-carrier transmitter (VDSL_LT) suitable for use in a time division duplexing system, said multi-carrier transmitter (VDSL_LT) comprising:

a. first pilot carrier generation means (IFFT, DAC), adapted to generate a first pilot carrier whose instantaneous frequency is a fraction of a sample rate and which is orthogonal to other carriers transmitted by said transmitter (VDSL_LT); and

b. first pilot carrier transmission means, coupled to said first pilot carrier generation means (IFFT, DAC) and adapted to transmit said first pilot carrier.

CHARACTERISED IN THAT said multi-carrier transmitter (VDSL_LT) further comprises:

c. second pilot carrier generation means (ROT, IFFT, T/S, DAC, PLL), adapted to generate a second pilot carrier whose mean frequency is a fraction of a time division duplexing frame rate and which is orthogonal to other carriers transmitted by said transmitter, said second pilot carrier being different from said first pilot carrier; and

d. second pilot carrier transmission means, coupled to said second pilot carrier generation means (ROT, IFFT, T/S, DAC, PLL) and adapted to transmit said second pilot carrier.

6. Multi-carrier receiver (VDSL_NT) suitable for use in a time division duplexing system, said multi-carrier receiver (VDSL_NT) comprising:

a. first pilot carrier receiving means (AGC, S/D, FFT, ROT1, PLL1), adapted to receive a first pilot carrier whose instantaneous

frequency is a fraction of a transmitter sample rate and which is orthogonal to other carriers received by said multi-carrier receiver (VDSL_NT).

CHARACTERIZED IN THAT said multi-carrier receiver (VDSL_NT) further comprises:

b. second pilot carrier receiving means (ADC, S/D, FFT, ROT2, ROT1, PLL1, PLL2), adapted to receive a second pilot carrier whose mean frequency is a fraction of a time division duplexing frame rate and which is orthogonal to other carriers received by said multi-carrier receiver (VDSL_NT), said second pilot carrier being different from said first pilot carrier.